RAILROAD ACCIDENT INVESTIGATION

REPORT NO 4062

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

LEE, ILL

NOVEMBER 6, 1965

INTERSTATE COMMERCE COMMISSION

WASHINGTON

SUMMARY

DATE	November 6, 1965
RAIL ROAD	Chicago, Burlington & Quincy
LOCATION	Lee, Ill.
KIND OF ACCIDENT	Derailment
TRAIN INVOLVED	Passenger
TRAIN NUMBER	31
LOCOMOTIVE NUMBERS	Diesel-electric units 9986B, 9970, 9926A. 9918A
CONSIST	14 cars
SPEED	90 m.p.h.
OPERATION	Signal indications
TRACK	Single, tangent, 0.4 percent ascending grade westward
WEATHER	Clear
TIME	4 02 p.m.
CASUALTIES	14 injured
CAUSE	Defective spring rail frog assembly due to inadequate maintenance
RECOMMENDATION	That the Chicago, Burlington & Quincy Railroad Company take such action as is necessary to insure the adequate maintenance of spring rail frog assemblies.

INTERSTATE COMMERCE COMMISSION

RAILROAD SAFETY AND SERVICE BOARD

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SYNOPSIS

On November 6, 1965 a westbound passenger train on the Chicago, Burlington & Quincy Railroad derailed at Lee, Ill Five passengers and nine employees were injured

The accident was caused by a defective spring rail frog assembly due to inadequate maintenance

LOCATION AND METHOD OF OPERATION

The accident occurred on that part of the Chicago and Aurora Divisions extending between Aurora and Savanna, Ill., a distance of 107.8 miles. In the accident area this is a single-track line over which trains operate by signal indications of a traffic control system supplemented by an automatic cab-signal system. At Lee, 33.8 miles west of Aurora, a siding 2,779 feet long parallels the main track on the north. The west siding-switch is 397 feet west of the station.

The derailment occurred on the main track 313 feet west of the Lee station, at the frog of the west turnout of the siding.

Details of the track, train, damages and other factors are set forth in the appendix.

DESCRIPTION AND DISCUSSION

No 31, a westbound first-class passenger train consisting of 4 diesel-electric units and 14 cars, left Aurora at 3 38 p m., on time. About 24 minutes later, as the train was passing Lee at 90 m.p.h , as indicated by the speed-recording tape, the middle and rear wheels on the north side of both trucks of the 3rd and 4th diesel-electric units, and the rear wheel on the north side of the front truck of the first car, derailed at the frog of the west turnout of the Lee siding and rerailed immediately afterward. The rear truck of the first car and all trucks of the 2nd to 14th cars, inclusive, then derailed at or near the frog. The crew members were unaware of anything being wrong before the train brakes applied in emergency as a result of the derailment.

Five passengers, seven dining-car employees, one train attendant and one sleeping-car employee were injured.

Examination of the train equipment after the accident disclosed no condition which could have contributed to the cause of the derailment Scraping marks extended around the outside of the rims of the middle and rear wheels on the north side of both trucks of the 3rd and 4th diesel-electric units and the north rear wheel of the front truck of the lst car Other appurtenances such as brake connection straps, brake rigging stabilizers, and spring plank safety straps on the north side of this equipment were bent, broken or scraped as a result of contact with the track structure.

Examination of the track structure throughout a considerable distance east of the frog involved disclosed no indication of defective track, dragging equipment or any obstruction having been on the track.

The first mark on the track structure was a gouge mark at the top of the inside face of the spring wing rail of the frog involved, starting 2 feet east of the frog point and extending westward about 3 feet. Beginning one foot west of the frog point, wheel marks appeared on top of bolt heads and on a metal foot guard 4 feet west of the frog point at a level of 3 inches below the top of the rail Scrape marks also appeared on the inside face of the spring wing rail beginning one foot west of the frog point and extending to the toe of the frog. The north wall of the toe block

was broken off at the base An old progressive fracture appeared along the easterly 14 3/4 inches of the break. The four bolts of the north wall, which formed the south side of the joint between the spring wing rail and the closure rail, were missing and apparently had been sheared off by derailed wheels The receiving end of the closure rail was heavily battered. The track structure was destroyed from the toe of the frog westward throughout a distance of 1,083 feet

The frog was provided with hold down horns and housings 8 inches and 39 inches east of the frog point. The welds securing the hold down housings to the frog base plate were broken. The bolts supplementing the welds were loose and the nuts had worked up to the cotter pins near the ends of the bolts. Those defective conditions permitted the spring wing rail to move 1 and 2 inches vertically at points 8 inches and 39 inches east of the frog point. A heavy coating of rust was found on the fractures of the welds and on the bolts. This indicated that the welds had been broken and that the bolts had been loose over a considerable period of time The loose condition of the hold down housings also permitted a 1 1/2 inch opening of the spring wing rail at the frog point, or 1 inch in excess of the prescribed 1/2-inch opening.

In addition to the hold down horn and housing assemblies, the frog was equipped with a spring wing rail "stabilizer", which consisted of a horizontal "U" shaped steel casting. The upper leg of the casting was flanged and was bolted to the north side of the spring wing rail in such manner that the lower leg pressed upward against the bottom of the frog base plate. This was designed to permit the spring wing rail to move laterally and to prevent the top of the spring wing rail from rising above the top of the adjacent long point rail of the frog. Examination disclosed that the lower leg of the stabilizer had broken off at the apex of the "U" shaped casting. The fracture showed 12 percent old break. Laboratory tests disclosed that the old break was due to a foundry defect. The remaining break was new and apparently resulted from a single impact.

FINDING

It is apparent, from the rust found on the fractures of the welds and bolts of the hold down housings, and the excessive clearance of the hold down horn and housing assemblies, that the frog was inadequately maintained and that the carrier relied on the spring

wing rail stabilizer alone to prevent excessive vertical movement of the spring wing rail.

The stabilizer apparently broke as the 1st and 2nd diesel-electric units of No. 31 moved over the frog. When the front wheels of the 3rd and 4th units, and the 1st car moved off the long point rail to the westerly portion of the spring wing rail, this portion of this wing rail was deflected downward and the easterly portion then rocked upward. The rims of the following wheels of each truck engaged the adjacent surface of the raised spring wing rail and forced it outward sufficiently for the wheels to drop into the throat at the point of the frog. The derailed wheels of the 3rd and 4th diesel-electric units, and the front truck of the first car, then rerailed on the closure rail. The remaining equipment derailed at the frog.

CAUSE

This accident was caused by a defective spring rail frog assembly due to inadequate maintenance

RECOMMENDATION

It is recommended that the Chicago, Burlington & Quincy Railroad Company take such action as is necessary to insure the adequate maintenance of spring rail frog assemblies.

Dated at Washington, D C , this 21st *day of* February 1966
By the Commission, Railroad Safety and Service Board

H NEIL GARSON
Secretary

(SEAL)

APPENDIX

Track

The main track is tangent a considerable distance east and west of the derailment point. The grade for westbound trains is 0.4 percent ascending 5,000 feet to the derailment point and a short distance westward.

The structure of the main track in the derailment area consists of 129-pound TR rail, 39 feet long, laid new in 1949 on an average of 24 treated ties to the rail length. It is fully tie-plated with double-shoulder tie plates, spiked with 2 rail holding spikes per tie plate, and is provided with 36-inch 6-hole joint bars and an average of 19 rail anchors per rail. It is ballasted with crushed slag to a depth of 12 inches below the ties.

The frog involved is a 129-pound TR left hand, No. 11, spring rail frog. It is 18 feet 3 inches long. The actual 1/2 inch frog point is 79 1/2 inches from the toe of the frog. The frog angle is 5° 12' 38". The double-coil spring assembly, which holds the spring wing rail against the long point rail, is 27 3/4 inches east of the frog point. The frog is supported by 1 toe plate, 1 heel plate, 4 frog plates, and 1 bare plate on 11 treated switch ties.

The carrier's records indicate that work was last performed on the west-siding switch at Lee, Ill. on October 8, 1965. The track in the accident area was given a 4-inch surface raise in 1951.

The last inspection of the track was made by a Track Supervisor from a moving motorcar on November 5, 1965 Previously the Roadmaster had made an inspection of the switch and frog at Lee, Ill., the latter part of September 1965

Train

No 31 consisted of car-body type diesel-electric units 9986B, 9970, 9926A, 9918A, coupled in multiple-unit control, 1 baggage car, 1 dormitory car, 1 coach, 1 dining car, 1 coach, 1 sleeping car, 1 dining car, 1 lounge car, 1 sleeping car, 3 coaches, 1 dining car and 1 parlor car, in that order. The cars were of all-steel construction and were equipped with tightlock couplers.

As the train approached the derailment point, the engineer and fireman were in the control compartment at the front of the first diesel-electric unit. The conductor, front brakeman and

flagman were at various locations in the cars The train brakes had been tested and had functioned properly. The headlight was lighted.

Damages

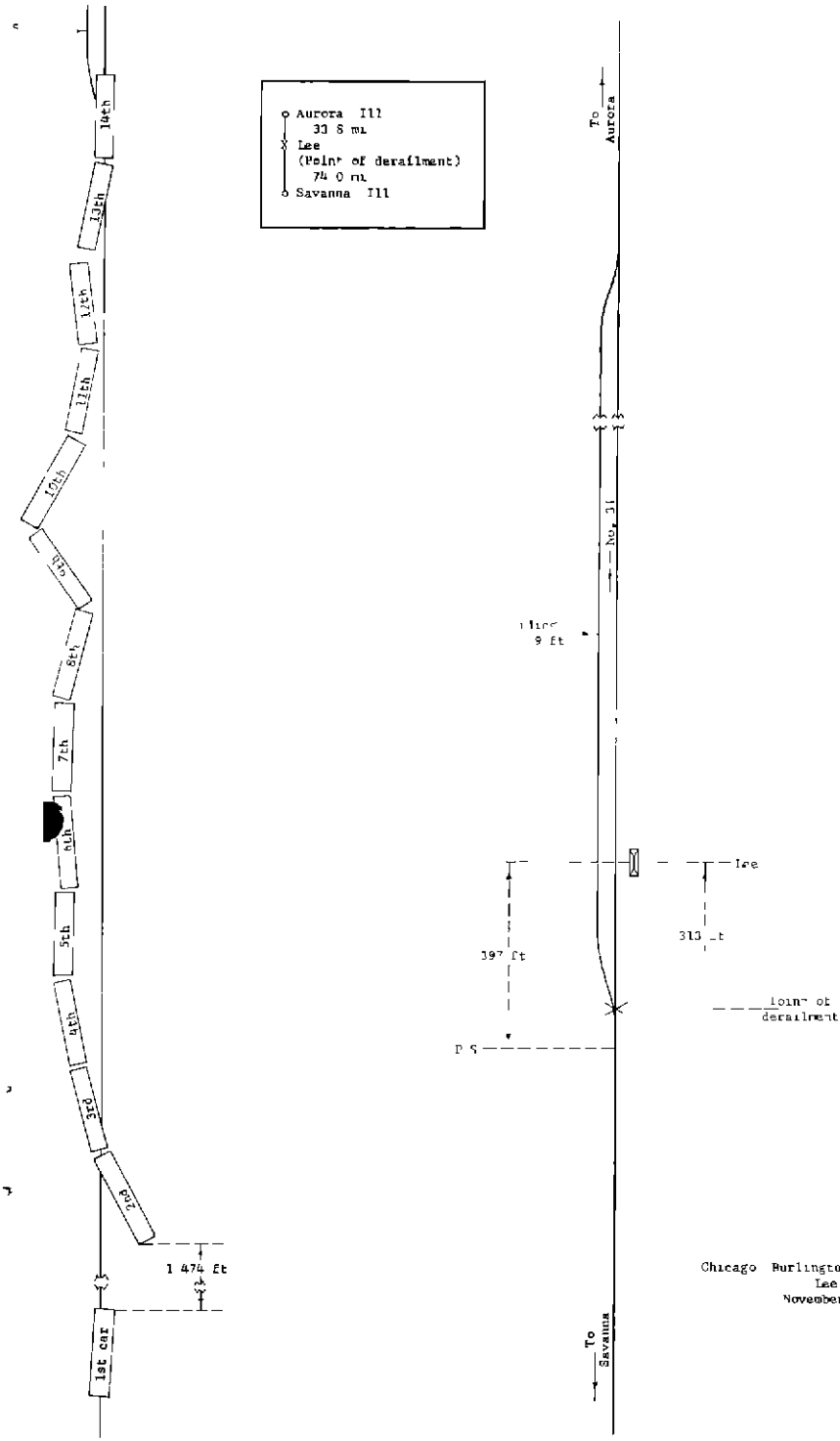
No. 31 stopped with the front end 2,928 feet west of the derailment point. The wheels of the rear truck of the first car and all wheels of the following 13 cars were derailed Separations occurred at both ends of the 2nd car and between the 9th and 10th cars. The 2nd car stopped 1,474 feet to the rear of the 1st car. The derailed cars stopped upright on or near the track structure as shown in the sketch appended to this report. The 3rd and 4th diesel-electric units were slightly damaged and all 14 cars were heavily damaged.

Other Factors

The accident occurred at 4·02 p.m., in clear weather.

The maximum authorized speed for passenger trains in the accident area is 90 m.p.h.

The average daily movement in the accident area during the 30-day period immediately preceding the day of the accident was 16 trains.



Chicago Burlington & Quincy Railroad
Lee, Ill
November 6 1965

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